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Special Arctic Report #2

THE MACKENZIE VALLEY HIGHWAY

by

Pollution Probe
at the
University of Toronto

October 19, 1972

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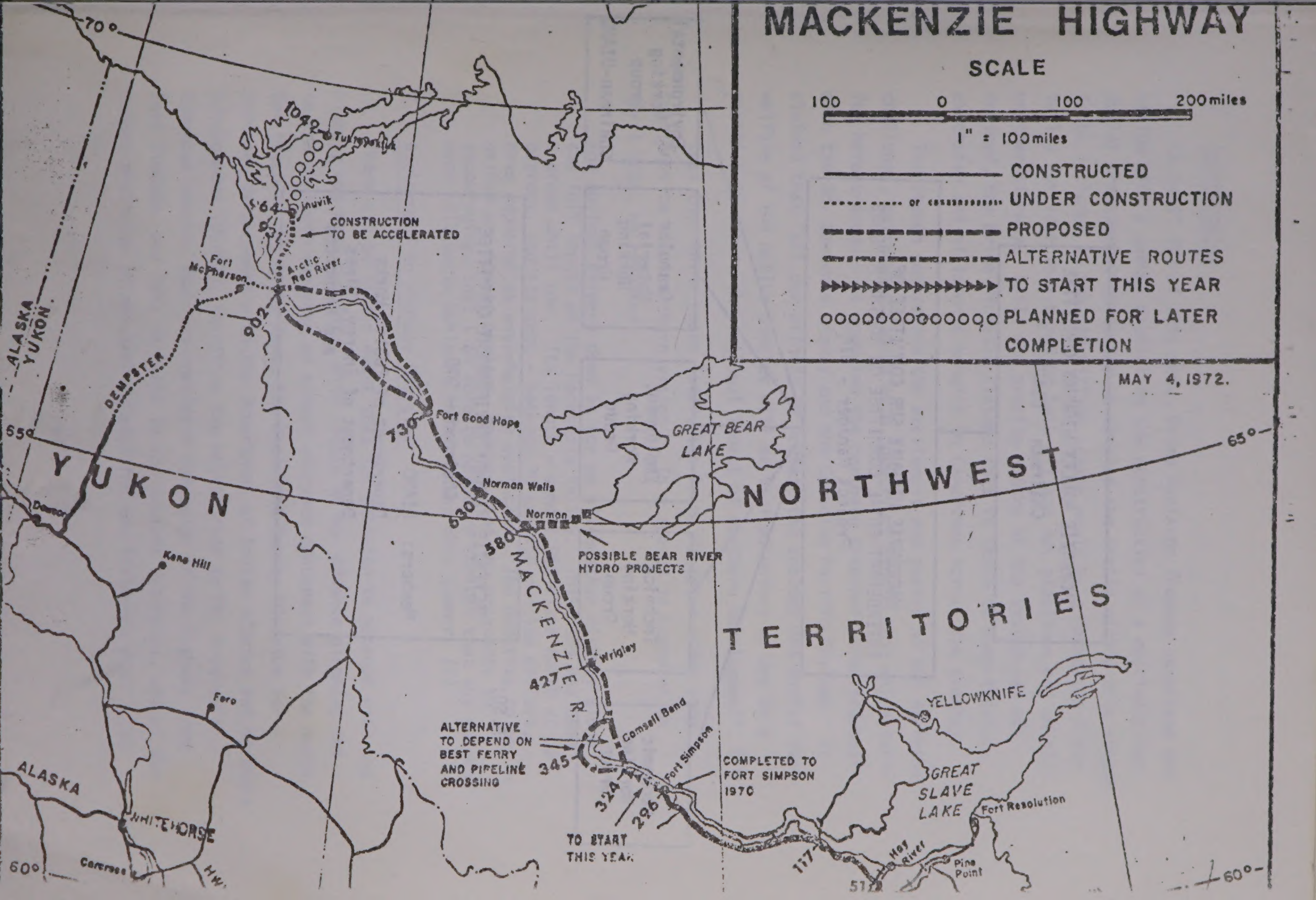
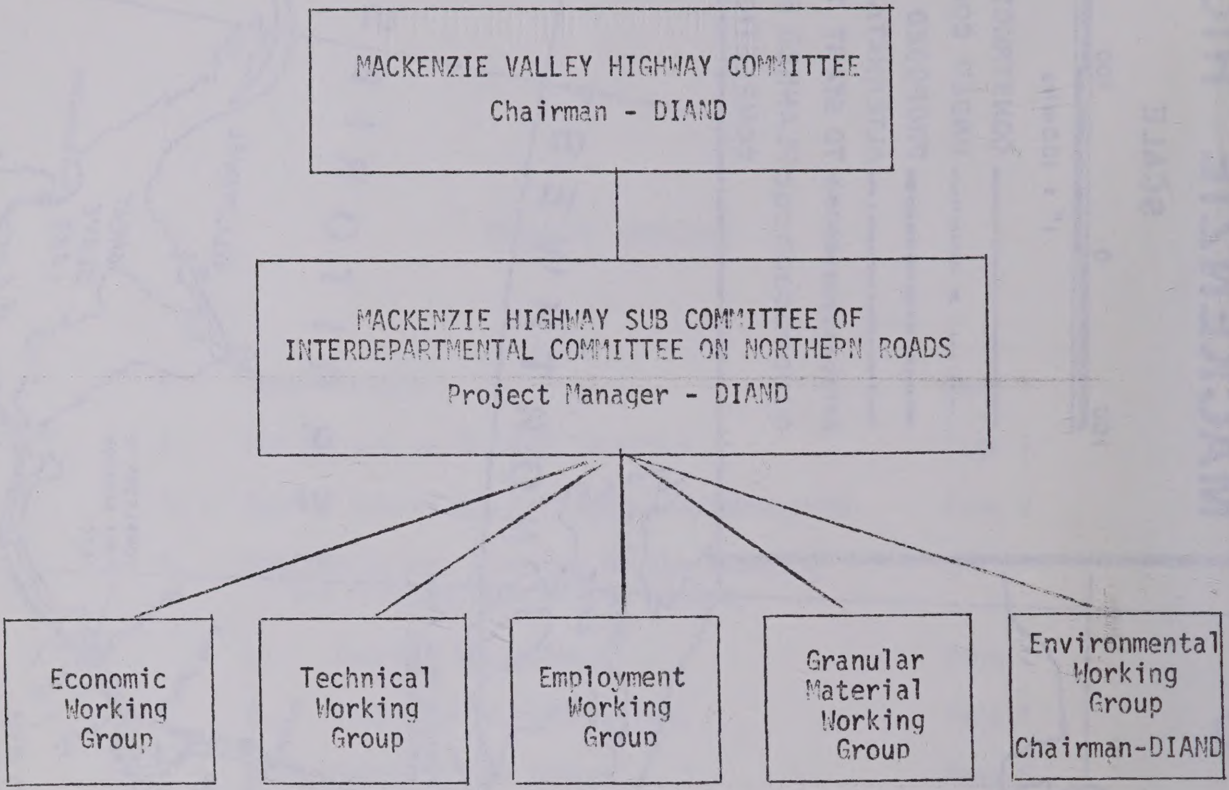


MACKENZIE HIGHWAY

MAY 4, 1972.


MACKENZIE VALLEY HIGHWAY COMMITTEE
Chairman - DIAND
MACKENZIE HIGHWAY SUB COMMITTEE OF INTERDEPARTMENTAL COMMITTEE ON NORTHERN ROADS
Project Manager - DIAND
Economic Working Group
Technical Working Group
Employment Working Group
Granular Material Working Group
Environmental Working Group
Chairman-DIAND

ALSO:

MACKENZIE HIGHWAY ENVIRONMENT COMMITTEE

Chairman - DOE

Members: DIAND
Department of Public Works
Department of Energy, Mines and Resources

1. Introduction

On April 8th of this year, Prime Minister Trudeau surprised the nation with a speech predicting the construction of a multi-billion-dollar transportation system to develop the Arctic within this decade. To be included in the $10 billion scheme would be a Mackenzie River Valley corridor incorporating both oil and gas pipelines and an all-weather highway. While the precise nature of the system was not defined, the Prime Minister claimed that it would be many-faceted, expensive and of immense benefit to Canadians across the country.

The speech emphasized the excitement and poetry of the northern challenge, portraying Canada as a country of heroic size which calls for heroic deeds. It compared the northern transportation proposal with the St. Lawrence Seaway and the Canadian Pacific Railway. It claimed that "all our efforts to protect the ecology and assist the welfare of the native peoples will be limited unless we are in a position to ensure the rational impact of northern development". (1)

Less than three weeks later, the Prime Minister added some substance to his 'northern vision'. In a speech in Edmonton on April 28th, he remarked:

> The obvious primary need is for an all-weather highway along the full length of the Mackenzie Valley. This road has been a dream until now. Its length - some 1,050 miles north of 60 degrees, and its cost - between 70 and 100 million dollars, have appeared as overwhelming obstacles. The benefits to be gained are now so obvious, however, and the prospects so encouraging, that I am able to announce tonight that the government will begin building this highway this summer. (2)

2. Background to Highway Decision

There can be little doubt that the decision to proceed with the highway was made suddenly, with little or no advance planning and to the complete surprise of almost everyone concerned with the north. For example, Mr. Digby Hunt, the Assistant Deputy Minister for Northern Development with the Department of Indian Affairs and Northern Development (DIAND), testified two weeks prior to Mr. Trudeau's Edmonton speech, that the northward extension of the highway from Fort Simpson was "not included in the present estimates, and at the moment provision is not contemplated for the following year". (3)

In other words, there were no plans to build the road until at least 1974, yet construction has now begun on this very section.

Structures were set up within the government to meet the political promises imposed by the Prime Minister. A Mackenzie Valley Highway Committee was set up and began its work in June. For the Department of the Environment (DOE), the announcement was a complete shock and not even the Deputy Minister, Mr. Robert Shaw, had any advance notice of the highway decision. The Mackenzie Highway Environment Committee, chaired by Mr. A.T. Davidson of DOE, did not meet until September.

3. Action Subsequent to Highway Announcement

It is also becoming obvious that the Prime Minister's speech was not just a pre-election promise soon to be forgotten. The work is proceeding at close to the rate which he promised. In Edmonton, the Prime Minister said the road "will be built ahead of any pipeline" (2), and the tentative completion date has since been set at 1974-75 (4) - the season before the pre-construction work of the gas pipeline is expected. (5) Mr. Trudeau claimed work would begin in the summer (2) and the contract for the new section north of Fort Simpson was awarded on October first. (4) Similarly, he promised that "survey work to fix the whole route ... will be finished before the end of this year" (2) and Mr. W. R. Binks, civil engineering director for the Department of Public Works (DPW), stated recently that "we will also complete our survey of the entire highway route this winter". (6)

The road is definitely no longer a dream and is fast becoming a reality. Mr. Chretien, the Minister of DIAND, stated in July, when he announced the calling of the first tenders for construction of the southern portion of the road, "I am confident that we have planned well and that the project will go through with a minimum of change to the environment and the preferred way of life for northern natives". (7) Let us turn now and examine this statement by looking at the problems which the highway planners and builders will undoubtedly have to face and see how and what solutions are being considered and found.

4. Considerations Relevant to the Planning and Construction of the Highway

a. Corridor Location

Perhaps the single-most important and pressing decision which the road planners will have to make is where the highway is to be located. The routing of the road will in large part determine its sociological and environmental impact and will be a major factor in its ultimate cost and technical proficiency. Moreover, the highway will form the backbone of the Mackenzie Corridor to which the government is committed. (8) The government's pipeline guidelines, issued in June, read in part:

> In view of the influence of the first trunk pipeline in shaping the transportation corridor system and in moulding the environmental and social future of the region, any applicant to build a first trunk pipeline within any segment of the corridor system outlined above must provide with his application:
>
> i) assessment of the suitability of the applicant's route for nearby routing of the other pipeline, in terms [of] environmental-social and terrain-engineering consequences of the other pipeline and the combined effect of the two pipelines;
>
> ii) assessment of the environmental-social impact of both pipelines on nearby settlements or nearby existing or proposed transportation systems; and
>
> iii) comparison of the applicant's proposed route with alternative pipeline routes, in terms of environmental and social factors as well as technical and cost considerations. (9)

Because of the influence of the highway in shaping the transportation corridor (in fact, the guidelines say pipeline-pipeline interactions are to be taken into account in the same way as pipeline-highway interactions), it is only fair and logical that the highway planners follow the same guidelines and make their information public as will the pipeliners. In fact, because it is the government's project and should therefore set an example; because it will largely determine the route of not one but two possible pipelines; and because it will probably have a greater social and environmental impact than the first possible pipeline (gas), it is especially important that the highway be adequately planned and constructed.

In May, Mr. Chretien admitted that "there is much to be done before we decide upon a location for the road between Camsell Bend and Arctic Red River". (8) Whatever had to be done, must now have been done because the route of the highway has been virtually chosen. This is made clear by Mr. Binks' recent statement that "We must call major tenders by early spring in order to meet our construction timetable". (6) This means that the survey lines that are now being cut from Camsell Bend to Fort Good Hope and which will be widened to 20 or 25 feet by bulldozer during this winter will be the final route for the highway. (10) If the entire route were not fixed during this season's freeze-up, it would mean a delay in beginning construction and hence the highway would not be completed before the beginning of pipeline construction, as the Prime Minister promised. We shall look now at the quantity and quality of the information available to the highway planners in determining the location and construction design for the road and their proficiency at answering the questions outlined in the pipeline guidelines.

b. Technical Considerations

One would, of course, assume that the government had the technical know-how to build such a road before deciding to proceed with the project and that this would be the least of the worries of the planners. Unfortunately, this does not seem to be the case. One of the most critical materials which will be required for building the Mackenzie Highway will be granular material or gravel. The U.S. Department of the Interior estimated that 21 million cubic yards of gravel would be required to build a 361 mile road to support the T.A.P.S. oil pipeline and that over 80 million cubic yards would be needed for the road, pipeline, air strips, oil fields, etc. (11) Canada's demand for gravel along a corridor containing two pipelines and a road could easily double this. Not only are we short of information on the quantity and location of our gravel reserves but it appears that we do not even know what type of granular material is best suited to highway construction. For example, a 25 mile stretch of road common to both the Dempster and Mackenzie Highways, built last winter from Inuvik, had virtually disappeared after the Spring break-up. Large sections were washed out by spring freshets; other sections failed because frozen silt and similar unsuitable material had been used as fill. The Contractor's Superintendent for this road is quoted as saying "The muck is pure permafrost material ... [in the spring] the federal government will know whether they must start all over again ... [the road] is serving as an experimental section in the use of permafrost road material". (12)

Dr. Robert F. Legget, former Director of the Division of Building Research within the National Research Council, wrote recently of this disaster in a paper on Technology for a Conference on Scientific Activities in Northern Canada:

> This is almost worse than rediscovering the wheel. If the writer had not seen this lamentable operation, he would not have been able to believe that such a thing could happen, so well and favourably known is Canadian engineering and construction around the world. It is a national disgrace, due to enforced neglect of well established northern technology. (12)

Dr. Legget, the Chairman of the Organizing Committee for the Canadian Northern Pipeline Research Conference held earlier this year, cites the example of other northern roads to show that "good roads can be built in the North provided adequate advance planning is done, supported by good detailed surveys for routes and for material supply". (12) He is, however, highly critical of the "undue haste" to build the Mackenzie Highway,

> for which no planning whatever appears to have been done, certainly no surveys had been carried out (they were started only this summer) and for which no traffic is in prospect ... Despite the lack of finished plans and the non-existence of survey results, with no assessment at all of available road-building material, tenders for the first section of the road were called for 1 August of this year. (12)

Dr. Legget claims that it "can be at best an eight or nine month road" and that "for most of this period, the ordinary winter-road of the North formed on compacted snow, would be almost as good, costing a minute fraction of what is suggested for this project." (12)

Thus, there appears to be some very real technical problems which will have to be overcome in very short order if this highway is to be a permanent fixture. The Prime Minister may well be correct when he predicts that the Mackenzie Highway will create additional economic opportunities for the North and West since the road may have to be rebuilt every year!

(c) Sociological Impact

Perhaps the most critical of all the factors which should have been used to determine whether or not to build a road and where to locate it is its sociological impact, since the coming of a highway to a community can have a large disruptive effect. Mr. Chretien feels that the road "will, I am sure, have a profound effect on the improvement of the living standards and economic opportunities for northern peoples". (8) Mr. Macdonald, the Minister of Energy, Mines and Resources, went on to claim that the government is "vitally concerned with the potential social costs and benefits of the highway and any proposed Pipeline". (13)

But the government's interest in the sociological impact of the highway on native northerners seems to be limited to employment considerations. This is reflected by the fact that there is no Sociological Working Group under the Mackenzie Highway Sub-Committee and that the closest thing to it is the Employment Working Group. This helps to explain why the major sociological requirement for the highway contractors is that "local native people be hired for all positions for which they are qualified". (7) It is true that there is now a consulting firm doing sociological studies for the Employment Working Group but the route will have been chosen long before their studies are finished. Although this private group began its organizing in the North less than a month ago, it has already attracted the ire of northern native organizations who recently sent a telegram to Mr. Chretien demanding that all further action by the non-native consulting firm be stopped.

It is certainly true that the highway will help to reduce the isolation of the Valley communities. But is a road the best way? It would appear that there has been little, if any, effort to determine the relative usefulness of a highway as opposed to other transportation alternatives such as a railway or subsidized and more frequent air service. Moreover, how useful will the road be during the winter with the darkness, severe weather conditions and the very long distances between settlements? What will be the annual maintenance cost for the highway and how will rivers be crossed during the Spring break-up and Fall freeze-up periods?

And what of the social costs involved? The availability of automobiles to the different economic levels will probably increase the tendency to develop slums and ghettos because the efforts to own and operate cars will waste what income is available in the lower income brackets and derelict cars may become a major component of slum areas. It is difficult enough to own and operate an automobile in the southern part of Canada but given the very severe

Winter conditions of the Arctic (coupled with the limited usefulness of roads for small communities separated by very long distances), the economic disadvantages of car ownership could well outweigh the advantages unless families or individuals can readily afford such expense. And what of the influence of outside transient workers during construction periods and the subsequent tourist inflow? All these are important questions which have not been approached squarely or openly.

The whole question of the sociological impact of northern development has been inadequately handled. Even the government's research program for northern pipelines has only two projects which deal with the socio-economic impact of pipelines and these will not have a finalized report for some time. There do not appear to be any relevant ones which deal with the impact of cars and highways. It is most ironic that the government should insist on the pipeline companies doing social impact studies which will be made public and yet makes little or no effort to undertake such studies relating to its own development schemes and is hesitant to make available any that it does do. (14)

d. Environmental Impact

The area that is of particular concern to Pollution Probe is the environmental impact which will result from the highway. The building of roads, as was authoritatively pointed out at the recent XXIV International Geological Congress in Montreal, causes more serious interference with the environment than any other civilian activity of man. (12) In the U.S. Department of the Interior's analysis of the impact of the Trans-Alaska Pipeline, there were three options presented for the operation of the road that was to be constructed along that route: a) public road, b) limited access by permit only, and c) private road for use of the pipeline company only. In terms of the environmental impact, the latter was presented as the only way to keep the impact at acceptable levels, principally because of the difficulties of controlling hunting and fires. Yet, in Canada, the highway is to be a public road.

The problems are not confined to Alaska. Dr. A.W.F. Banfield, who spent many years as a research biologist with the Canadian

Wildlife Service and was later a Director of the National Museum of Canada, reports problems with the new Dempster Highway through the Yukon. Sport hunting took a heavy toll as "new hunting camps were established and the hunters waited in their vehicles for the caribou to cross the road in front of them. Piles of viscera litter the roadside where the quarry were killed and gutted". (15) In Scandinavia, forest fires, hunters and accidental deaths inflicted by highway traffic lead to "a significant mortality of domestic reindeer on Scandinavian highways". (15) In addition, other features such as snow fences and humming powerlines will also act as deterrents to migrating caribou.

In a consultant's report on another recent road in northern Canada, the Liard Highway, the following points were made:

- Due to the use of "turnpiking" (building highway from material stripped from the right-of-way) wind and water erosion is already extensive along the highway.
- Where borrow pits were used, they were generally operated poorly; access roads were unsightly; sides were too steep and slumping is occurring; overburden and timber have just been pushed into the standing timber.
- The disposal of grubbing materials has been very poor; generally just pushed into the trees along the road.
- There have been considerable problems created by off the right-of-way travel.
- Two river crossings were not done well; they will result in erosion and probably cause problems for fish.

As Dr. Banfield concludes, "there has been no attention paid to the environmental values of the landscape over which the road passes, nor to the aesthetics of the scenery. Local environmental problems have been dealt with by the most economical methods at hand." (15)

But this is all said to be a thing of the past. The Prime Minister commented in April that "we must be ... certain that [highways and pipelines] will not lead to ecological devastation" (2) before we build them. Let us return for a minute to the enormous quantities of gravel which will be required for the corridor. In the past, stream beds have often been used for this purpose but it is not clear whether this should be allowed since dredging operations can cause serious changes in the spawning beds or habitat of the fish.

The government has several studies under the Northern Pipelines Research program designed to provide enough information so that river crossings and possibly dredging can take place without seriously affecting the aquatic ecology. One such study begun in 1971 by the Fisheries Research Board, was originally estimated by it its organizers to require 5 years to yield useful information. However, the group has had its time horizon reduced to 3 years which it does not think will be totally adequate. Moreover, because of insufficient funding and manpower, many of the proposed programs have had to be cancelled and the simulation of pipeline crossings and their construction could not be carried out in experimental watersheds. The group tentatively recommended that pipeline routes avoid the major clear, low-velocity rivers.

Similarly, a three-year study begun in 1971 on the Fish Resources of the Mackenzie River Valley concluded that "it appeared that the clear east side Mackenzie streams were more important than the turbid west side streams for fish production" and pointed out that "sizeable native sustenance fisheries exist in the delta area and around many settlements throughout the valley".(16) Although both these studies are not nearly complete, the government has decided to build the highway on the east side - the side which they both recommended be avoided.

This is not the only example of environmental matters being given little or no attention. Shortly after the highway decision was announced, it was decided that because of the tight construction timetable of DPW, it would be impossible to do anything more than an 'environmental overview study'. A contract for that study was let in the summer to Renewable Resources Consulting Services Ltd. and its report is expected early next year. (17) It is interesting to note that the Environmental Working Group initially turned down this Edmonton group but was later told from above to approve the study.

Ignoring for a minute the fact that the highway route will long since have been chosen by the time this firm reports, the usefulness of the study is also questionable. The group plans to do no field work of its own but rather will assemble the material that is already available from the pipeline studies. This will lead to the neglect of the very important aspects of the impact of the use of the highway on the environment and northern communities. The vastly different environmental impact of a pipeline and highway was recognized by the U.S. Department of the Interior in its statement on the T.A.P.S. project (see page 7). This is recognized by the Environment Protection Board (sponsored by Gas Arctic Systems which has merged to become Canadian Arctic Gas Study Ltd.) which noted that "its research and conclusions would need considerable amplification to apply to other facilities such as a highway or oil pipeline". (18) Similarly, it is difficult to see the relevance to highways of many of the programs under the government's Northern Pipeline Research Project, particularly since few of these studies have prepared a final report and the government has not yet received results of work done by industry since last spring.

Yet, the environmental-social decisions pertaining to the highway will be based upon the pipeline studies. The question then arises of how accurate and extensive are the pipeline studies. In the last 5 months, a number of top-level scientists throughout Canada with northern interests have made some strong statements concerning the quantity and quality of the environmental work which has been conducted in the Arctic. Dr. F. Kenneth Hare, now the Director-General of the Research Coordination Directorate of the federal Department of the Environment, did, as his first job, an assessment of the Department's northern programs. (19) In a report entitled 'The Natural Environment of the Canadian North', dated August 31st of this year, Dr. Hare concluded:

> Qualitatively I can say flatly that Canada's past and present scientific effort in the north is not adequate for the purposes of either resource development or environmental protection ... In many aspects of the northern environments we do not have enough basic knowledge to design good management methods and technologies. We have become adept at getting fairly general knowledge on the basis of a limited amount of scientific effort. But general knowledge is not good enough when one is going to build a pipeline, or bury one in the sea, or build a new town or airstrip, or design a harbour. In such cases one needs specific information based on local investigation. And there is very little specific information about most local sites in northern Canada. (20)

Dr. Max Dunbar, a biology professor at McGill University, and one of the world's most highly respected marine ecologists, in a paper on Research on Renewable Resources for the same scientific conference held in October, 1972, called for a moratorium on oil and mineral development until scientific research can catch up with the problems involved. He claims that:

> We have to have time to do a number of technological research jobs and to put a great deal of new effort into census of wild-life species; we have to know precisely how delicate or how tough the Arctic ecosystems really are, so as to be able to decide how much stress, or technologically rough treatment, they can stand ... there is a great deal to do in accelerating wildlife research; fresh water resources need a great deal more attention than they receive at present; and the most serious lack is in the study of ecosystems as whole functioning units. (21)

Dr. John Lambert, a biology professor at Carleton University, wrote in May of the upcoming pipeline applications: "The Government will have to base its decision on very meagre information. To study in detail the natural disturbances would take a decade providing enough personnel were available". Later in the same paper he remarked "An objective long-term policy of development would place a pipeline development within the realm of reality. Ten to fifteen years from now when ecological studies can be feasibly completed. All we are planning for is future confusion". (22)

Another zoologist, Dr. J.B. Sprague, summed up the central theme of his May paper on 'Aquatic Resources in the Canadian North' thus:

> - that our ignorance of Arctic aquatic ecosystems is profound,
> - that the danger of irretrievably destroying these biological resources is great;
> - and that basic ecological research should be completed, and effective management procedures established, before extensive northern development is undertaken.
>
> The last aim could be quite reasonably achieved by beefing up ecological research by a factor of something like ten times, and holding off any massive Arctic exploration for something less than a decade. (23)

The criticisms of the quantity and quality of environmental research in the north are numerous, as the above remarks show. Even the pipeline industry's environmental agency remarked in June that "there are many questions that may be raised for which field programs presently underway cannot provide answers and much more field work and other studies will be required". The Board went on to complain that it did not even know the primary and alternative pipeline routes let alone more detailed technical specifications. (24) And Mr. Robert Shaw, the Deputy Minister of Environment Canada, admitted publicly last April that there was a great deal more work required in the Arctic. (25)

And so we are left to conclude that the environmental studies for the pipeline are inadequate at present, that in any case they are not particularly relevant in assessing the impact of the highway and that the time frame within which the highway planners and builders are operating is such that they will not be important anyway. This is clearly revealed by statements made by various civil servants. Mr. Bill Kleghorn, the Project Manager of the highway, claims that the route of the highway has not yet been determined because there is not yet enough information available and the various working groups on the highway would have to approve the final route after seeing studies on it. (26) But Mr. Binks of DPW which is administering and designing the highway, said publicly that many of the contracts would have to be called by early Spring (6), a fact substantiated by the relentless march northward of the survey line and bulldozers. Hence, it is obvious that the various highway committees will be called upon shortly to rubber stamp the route that has been cleared to ensure that the deadline promised by the Prime Minister will be met. There is no way that environmental considerations will be anything other than after-the-fact.

Another revealing insight into the relevance of environmental considerations is obtained by looking at the role played by the various concerned Departments in the decision-making process. It is quite obvious that the Department of Public Works is setting the pace. It has its orders from the very top as to when the highway must be finished and it has simply worked back to determine when critical decisions will have to be made. The timetable specifies that route location is now to be complete and that contracts for all construction will be let by 1973. This frantic timetable does not fit well with the Department of the Environment with the result that it is being largely ignored. The Mackenzie Highway Environment Committee, chaired by an Assistant Deputy Minister of Environment, seems to have been an afterthought since it did not meet until September.

The group (with one representative each from the Department of Environment, Energy, Mines and Resources, Indian Affairs and Northern Development and Public Works) was formed to present a visible profile for the public eye to assure it that environmental considerations are being taken into account (after all, there are now two environmental committees) and to make the 'rubber stamping' process a little less obvious. The Environment Committee has no veto power but can bring its criticisms to the attention of Cabinet ministers. In the Spring, it will be asked to approve almost 400 miles of bulldozed route. Should it refuse, it is unlikely to find any substantial support in Cabinet since locating a new route would mean setting back the whole operation by a year. Hence, the Department of the Environment will be forced to endorse the route and work will proceed.

The inability of the Department of the Environment to influence policy matters has already become apparent. The major decisions were made and work started long before DOE was invited to participate. The Department suggested that three steps were necessary to incorporate environmental considerations: a) development of guidelines for designing and locating the highway, b) environmental considerations for route approval, c) stipulations for construction. As major decisions and actions have already been taken with respect to all of, or significant portions of all of these points, it is obvious that DOE cannot do the job it would like to do.

The other environmental group, the Environmental Working Group chaired by Mr. John Naysmith of DIAND, has concerned itself to date largely with hiring environmental consultants and with drawing up environmental requirements for contractors. It is primarily a technical committee dealing with day to day problems and has only one representative from the Department of the Environment (out of a total membership of more than a dozen). Beginning in November, the group will be shown DPW's preliminary design plans and be asked to review and approve twenty miles per week. The powerlessness of this group is revealled by the fact that construction has now begun on the section out of Fort Simpson although the Environmental Working Group has not even seen, let alone approved, the design plan. (27) And the section out of Inuvik is not even subject to the scrutiny of this group since the contract for its construction was let last year.

As Dr. Hare of the Department of the Environment pointed out earlier, there is a great lack of specific information based on local investigation in northern Canada and this is the type of information that is needed to carry out any major project (see page 10). Because of the obvious weaknesses of the 'environmental overview study', DPW has let a consulting contract for more detailed studies for each of three sections of the route. The effectiveness of this can be judged by the fact that the contract for these detailed investigations was let at very nearly the same time as the construction began north of Fort Simpson several weeks ago. The government was so desperate for information that the consultant, F.F. Slaney, had men in the field before the contract was formally signed, sealed and delivered. (28) One must question the credibility and sincerity of an environmental consulting firm which would accept a contract drawn up and controlled by the Department of Public Works to conduct detailed ecological studies along a route which has already been determined and on which construction is proceeding rapidly. While outside consulting firms give an air of independence to an investigation, it is well known that any company wishing to survive for a long period must produce reports favourable to its employer. Unfavourable reports will be rejected and remain confidential and that firm will not be hired in the future. Special care must have been taken in the choice of consultants for this particularly sensitive project. As the respected scholar J. Tuzo Wilson recently remarked:

> All members of consultative bodies are appointed directly or indirectly by the government for short terms and those who speak out are not asked back. Therefore many things which should be said are not said and a pall of subservience and mediocrity hangs over Canadian science because daring and originality have been largely stifled by successive governments. (29)

A careful reading of the environmental requirements released with the calling for tenders for the construction of the first section of the highway, reveals how lightly environmental considerations will be taken. The terms of reference for the Mackenzie Valley Highway Committee are very permissive: they suggest that the DPW will be required, where appropriate, to provide environmental protection. This attitude is reflected in the Environmental Protection Requirements which state that "the Contractor will be required, where this is appropriate, to enter into agreements containing stipulations that detail specific undertakings". (7) One wonders if it will not be appropriate because the construction timetable does not have time for the necessary studies.

The 'requirements' go on to say that the government will provide overview studies (based, it admits, on an assessment and evaluation of pipeline environmental data) and will identify areas which "may require future in-depth studies". (7) The release then lists concerns which are well sprinkled with words such as 'minimize', 'minimum', 'minimal', 'adequate', 'appropriate', etc. Many of the items would require years of in-depth research for answers (eg the movement and migration patterns of wild animals such as caribou) and it is ludicrous to expect that the contractor can do these studies adequately as he is building the road. A combination of discretion, vague terminology and impossible tasks for the contractor ensure that environmental considerations will, once again, be after-the-fact.

In preparing the environmental requirements for the highway, DIAND has been very secretive and it does not appear that there will be any opportunity whatsoever for public discussion of the guidelines. They were drafted in a very short time without much involvement, if any, of DOE by gathering what looked to be pertinent material from government and industry work on environmental impact studies of pipelines. There does not seem to be any evidence that the recommendations of recently completed consultants' reports on other northern highways have been heeded. Once again, the government has shown that it considers itself above the rules. At least in the case of the pipeline guidelines, comments were invited and the guidelines are subject to revision. In the case of the highway requirements, no comments were solicited during drafting or subsequent to publication.

The actual construction of the highway also promises to cause substantial damage. The DPW controls the building operations and it has suggested that, where possible, the construction technique of 'turnpiking' will be used. This is the technique in which material stripped from the right-of-way is used to build the highway rather than using material taken from borrow pits located along the route. This decision was taken in spite of the fact that a consultants' study of completed sections of the Liard Highway led to recommendations that this technique not be used in the North due to the very apparent wind and water erosion which has resulted. They note that turnpiking makes it very unlikely that there will ever be any plant cover established along the right-of-way after it has been stripped.

In the terms of reference of the environmental consultant services for DPW, there is reference to an educational program for bidders, contractors and DPW field staff. There is provision for briefing only of personnel. It is quite clear from the work of the pipeline companies in both Canada and Alaska that the training and controlling of the individual construction workers will be one of the most important aspects of an environmental protection system. It would seem that a 'briefing' will be completely inadequate. There should be provisions for rigid control of operating procedures, fire arms, fire, pesticides, waste, etc. There should be an adequate system of fines on other penalties to ensure that guidelines are adhered to. Once construction practices become established and workers fix their attitudes and patterns of behaviour, it will be extremely difficult to tighten up environmental standards.

The government has also shown evidence of breaking its own environmental rules in order to keep the road on schedule. For example, when DPW applied for a land use permit to operate a tracked vehicle in the summer out of Fort Simpson, it was turned down by the Yellowknife office of DIAND. Undaunted, Public Works skipped the normal channels and received special permission from Ottawa to operate the machine. In a similar vein, under the Northern Inland Waters Act, DIAND is faced with the problem of having to hold time-consuming public hearings in order to obtain water use licences for the right to build a road across a river. The Department will probably get around this potentially-delaying obstacle by lumping the crossings together and holding one hearing for them all; deciding that the crossings will not "adversely affect the use of waters" (30) and thereby dispense with the need for a licence and hearing completely; or grant an easement to DPW after they have complied with certain stipulations. (31)

One can only conclude, after this examination of the government's northern environmental policy, as it relates to the Mackenzie highway, that environmental considerations will, once again, be after-the-fact. The Prime Minister's claim that the government is certain that the highway will not lead to ecological devastation (2) and Mr. Chretien's comment that the road is being well planned (8) are, at best, wishful thinking and, at worst, outright deceit.

5. Motives for the Highway Announcement

Since the overriding consideration in building this highway seems to have been to minimize completion time, it would be constructive to investigate the motives behind rushing ahead with the road. There have been two principal reasons put forward by government representatives as to why the highway is proceeding. The first concerns the positive effect which such a road would have on subsequent pipeline construction. This was explained most clearly by Mr. Hunt as he testified two weeks before the highway extension decision was made:

> I hesitate to go any further, Mr. Chairman, because of course the desirability of extending the Mackenzie highway northward from Fort Simpson is tied up to a very large extent with the planning and timing of pipe lines. It could be that as a result of this pipe line, or pipe line construction should it come along, then the timing of extending the Mackenzie highway north from Fort Simpson might well be tied to this and accelerate. (3)

Mr. Trudeau mentioned in his Edmonton speech, that the road "will be built ahead of any pipelines and will therefore offer considerable cost savings to them during the construction period". (2) Similarly, Mr. Chretien indicated "We must ensure that the location of the road will be such that any pipeline will be able to take maximum advantage of the corridor system during construction". (8) The importance of this element is also demonstrated by the fact that the Economic Working Group of the Highway Committee has as its major project to date, prepared a report on the savings the highway will bring to those constructing pipelines through the Valley.

Industry spokesmen reacted to the Prime Minister's speech by claiming "the highway is not essential to construction of the pipelines to tap Arctic and Prudhoe Bay oil and gas" while admitting that "it will be useful to the development ... of the North".(32) Undoubtedly it is true that the highway is not essential for pipeline construction but it is equally certain that a road will facilitate pipe laying. More important than the cost savings which will result from such a road is the clear indication, as evidenced bythe government's own shortcircuiting of mechanisms designed to minimize adverse environmental-social effects in order to rush ahead with the highway, that the pipeline guidelines are a mere ruse to assure the people that these important matters are being carefully handled. That the importance of these factors has already been minimized and the desirability of a pipeline established, is clearly shown in a February speech by the chairman of the National Energy Board, the body which will have to determine the fate of all northern pipeline applications:

> There is no doubt that pipelines can be built in the north and that such pipelines can be rendered safe to the environment and compatible with major sociological objectives and programs. There is a danger, however, of the pipelines being priced out of the market if industry is compelled to meet standards which entail unrealistically high-cost components. Thus the guidelines must be translated into regulations and specific conditions which meet the concerns of the Government and the public and which are realistic and operable. This will require extensive dialogue between government and industry. (33)

The 'kangaroo court' nature of the National Energy Board hearings was further revealed by Mr. Chretien in the following speech in May, 1972.

> I can only repeat that the government is ready at any time to receive an application for an oil or a gas pipeline. By the end of the year environmental and social studies will be in our hands. We will then be in a position to assess the impact of a pipeline and commence the normal process of approving and granting the necessary certificates and rights-of-way. (8)

This bending over backwards to assure industry that pipelines will be approved and that social and environmental restraints will not be a serious restraint on their plans would not be so necessary if we were only talking about a gas pipeline since its backers have already decided that the Mackenzie Valley route is the most economical way of removing the gas and will soon be applying to the National Energy Board for a permit to build this pipeline. But the companies attempting to remove the Prudhoe Bay oil by a pipeline and tanker route are being delayed in the U.S. courts and are looking for the fastest possible way to get that oil to market and begin profiting by it. Thus, any move by the Canadian government to speed up and facilitate the construction of pipelines could affect the routing decision by the oil companies. That such a consideration was an important element in the minds of the Cabinet when it decided to proceed with the highway is illustrated by a letter which Mr. Macdonald, the Minister of Energy, Mines and Resources, wrote to the U.S. Secretary of the Interior several days after the highway announcement:

> Such a road will, in our judgement, substantially ease the construction of a pipeline. This decision is, I think, a significant new factor which affects the balance of advantage between alternative routes. I am sure it will be taken into account by any private entities that may be interested in building an oil or a gas pipeline, and I think it ought to be a factor in governmental assessment as well ... I would confirm to you my comments in Washington on March 30th last that, in the opinion of our technical advisers, there should be no reason why regulatory and governmental consideration could not be given in an expeditious manner commencing with an application filed by the end of this year. (34)

The other alleged reason for rushing ahead to build the highway is to meet the needs of the northern people. But considering that the government has done little, or no, sociological studies of the impact of the road and alternative means of transportation, and that the 'needs' of northerners have not as yet been clearly defined, this is a very questionable motive. The native groups have denounced the highway and called for a land freeze until their land rights, claims and other interests have been settled. (35) And the Progressive Conservative candidate for the N.W.T. in this election feels confident running on a platform promising that his party would stop construction of the highway.

6. Conclusion

One must conclude that the main reason for bulldozing ahead with the road is to aid and encourage the subsequent construction of oil and gas pipelines down the Mackenzie Corridor. That the government is now committed to northern pipelines is made clear by Mr. Macdonald's February comment "You have to take a Mackenzie Valley pipeline as a given element of energy policy". He added that he was referring to both an oil and a gas pipeline. (36)

Just as the highway planners are not giving serious consideration to environmental and social concerns, pipeline builders will also undoubtedly work through the same "rubber stamping" process. It becomes obvious that the pipeline guidelines issued in June will turn out to be a 'sick joke' designed to assure the public that everything is being competently handled. One wonders if the government will ever take environmental considerations seriously and ask such questions before, not after, a decision has been made.

Notes

1. From The Toronto Star and the Globe and Mail, April 10, 1972.
2. 'Notes for Remarks by the Prime Minister to a Public Meeting', Edmonton, Alberta, April 28, 1972.
3. 'Minutes of Proceedings and Evidence of the Standing Committee on Indian Affairs and Northern Development', Ottawa, Issue No. 4, April 13, 1972.
4. Globe and Mail, October 4, 1972
5. Globe and Mail, October 3, 1972
6. Globe and Mail, October 6, 1972
7. Department of Indian Affairs and Northern Development, Press Release: 'Ready for First New Tender on Accelerated Mackenzie Highway Project', Yellowknife, July 12, 1972.
8. Chretien, J., 'Mackenzie Corridor: Vision Becomes Reality', May 11, 1972
9. Department of Indian Affairs and Northern Development, 'Expanded Guidelines for Northern Pipelines', June, 1972.
10. 'News of the North', Yellowknife, September 28, 1972.
11. U.S. Department of the Interior, Final Environmental Impact Statement - Proposed Trans-Alaska Pipeline: Summary Volume No. 1, 1972
12. Legget, R.F., 'Technology' - Paper No. 5 prepared for the Seminar on Guidelines for Scientific Activities in Northern Canada, August 31, 1972.
13. Telegram from Donald Macdonald to Committee for an Independent Canada, October, 1972.
14. See correspondence with Digby Hunt, July 24, 1972, which states "no decision has yet been made about how widely [these three sociological studies] are to be distributed".
15. Banfield, A.W.F., 'Northern Ecology, Pipelines and Highways' in Nature Canada, April/June 1972.
16. 'Report on Research under the Environmental-Social Program Northern Pipelines', Ottawa, May, 1972.
17. Some of this information obtained from Dr. Senenchuk of Renewable Resources Consulting Services, Ltd., October 13, 1972.
18. Environment Protection Board, 'Towards an Environmental Impact Assessment of a Gas Pipeline from Prudhoe Bay, Alaska to Alberta: Interim Report No. 1', Winnipeg, December, 1972.
19. Correspondence with Kenneth Hare, June 7, 1972.

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20. Hare, F.K., 'The Natural Environment of the Canadian North' - a paper prepared for the Seminar on Guidelines for Scientific Activities in Northern Canada, Ottawa, August 31, 1972.

21. Dunbar, M., 'Research on Renewable Resources' - a paper prepared for the Seminar on Guidelines for Scientific Activities in Northern Canada, August, 1972.

22. Lambert, J., 'Terrestrial Environments (Vegetation and Permafrost)' - a paper prepared for the National Workshop of the Canadian Arctic Resources Committee, May, 1972.

23. Sprague, J.B., 'Aquatic Resources in the Canadian North: Knowledge, Dangers, and Research Needs' - a paper prepared for the National Workshop of the Canadian Arctic Resources Committee, May, 1972.

24. Environment Protection Board, 'Environmental Implications of the Engineering Design: Interim Report No. 2', Winnipeg, June, 1972.

25. Comments made by Robert Shaw at the Canadian Preparatory Committee for the United Nations Conference on the Human Environment Meeting in Toronto, April 17, 1972.

26. Conversation with W. G. Kleghorn, Project Manager, Mackenzie Highway, October 12, 1972.

27. From conversations with Michael Romaine (DOE) and Ken Hawkins (DIAND), October 17, 1972.

28. From conversation with Bob Weeb of F.F. Slaney, October 13, 1972.

29. Wilson, J.T., 'International Research' - a paper prepared for the Seminar on Guidelines for Scientific Activities in Northern Canada, October, 1972.

30. Northern Inland Waters Act and its Regulations

31. From discussions with Mr. Jones (DIAND), October 17, 1972.

32. Globe and Mail, May 4, 1972

33. Howland, R.D., 'Principal Requirements for Northern Pipelines', Ottawa, February 3, 1972.

34. Letter from Donald Macdonald to Rogers Morton, May 5, 1972.

35. See the discussions at the National Workshop of the Canadian Arctic Resources Committee, May, 1972 and the Globe and Mail, May 1, 1972.

36. Globe and Mail, February 22, 1972.

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